DOCUMENT RESUME

ED 330 885 CE 057 736

AUTHOR Taylor, Maurice C.
TITLE Workplace Literacy Assessment Tools.
PUB DATE Jun 90
NOTE 8p.; Paper presented at the Annual Conference of the Canadian Association for the Study of Adult Education (9th, Vancouver, British Columbia, June 1990).
PUB TYPE Speeches/Conference Papers (150) -- Viewpoints (Opinion/Position Papers, Essays, etc.) (120)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Adult Literacy; *Basic Skills; Educational Needs; Employment Practices; *Employment Qualifications; Entry Workers; Foreign Countries; Literacy Education; On the Job Training; Postsecondary Education; Reading Achievement; Reading Skills; Skilled Occupations; *Student Evaluation; *Test Content; *Tests; *Test Selection; Test Use; Vocational Education; Writing Skills
IDENTIFIERS Canada; Canadian Adult Achievement Test; Gates MacGinitie Reading Tests; Test of Adult Basic Education; *Workplace Literacy

ABSTRACT

Following a discussion of the basic skills required for an adaptable work force and how employers and workplace literacy providers determine which employees require basic skills training, this paper reviews three literacy instruments that can be used in workplace basic skills programs. A basic skills profile is drawn based on a review of the literature. The test reviews are based on information from the actual test, the test manuals and administrator's guidelines, technical bulletins, a literature search, the Mental Measurements Yearbook, and interviews with instructors in adult literacy and basic education programs. Tests reviewed are the Canadian Adult Achievement Test, the Test of Adult Basic Education Forms 5 and 6, and the Gates-MacGinitie Reading Tests Canadian Edition. For each test, information is given on test content, test development, and test usability. The paper suggests that criterion-referenced tests should be developed for employees in basic workplace training, using specific work-related skills. (KC)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

Proceedings of the 9th Annual Conference of the Canadian Association for the Study of Adult Education, Victoria, British Columbia. (1990).

WORKPLACE LITERACY ASSESSMENT TOOLS

Maurice C. Taylor
Algonquin College
Adult Basic Education

ED330885

ABSTRACT

In setting up a workplace basic skills program one of the most important elements is the assessment of the individual employee. Because this field is still evolving, research on different instruments used in these programs is sketchy. However, evaluating the appropriateness of existing literacy instruments for use in workplace basic skills programs may provide some insight into further test development strategies. A technical review of three such instruments is presented here.

RÉSUMÉ

L'un des aspects les plus importants à considérer lors de la mise sur pied d'un programme de formation de base au travail est l'évaluation de rendement du personnel. Étant donné que ce domaine est encore en évolution, la recherche sur les différents tests utilisés dans ces programmes est incomplète. Cependant, une évaluation de la pertinence des tests de capacité à lire et à écrire existant à l'intérieur des programmes de formation de base au travail peut fournir des stratégies pour le développement de nouveaux tests. Une revue technique de trois de ces tests est présentée ici.

The impact of adult illiteracy in the Canadian workforce has become increasingly visible. There now exists a growing gap between the demands needed in the workplace and the skills resident in the workforce. In order to move towards helping Canadian workers obtain the necessary skills needed for full productivity several key questions require discussion. Of particular interest to this investigation are the following two questions: what are the basic skills required for an adaptable workforce and how do employers and workplace literacy providers determine which employees require basic skills training? In an attempt to provide relevant information on these issues, this investigation examined the appropriateness of frequently used literacy-related assessment tools for workplace basic skills training.

Workplace Literacy Requirements

Because the literacy demands of the workplace are different from general literacy requirements, researchers have begun to identify the basic skills individuals need in order to enter and progress in the workplace. For example, Hull and Sechler (1987) examined the nature and extent of adult literacy needs in several major U.S. corporations. Results from the study indicated that basic literacy skills often serve as prerequisites to the learning of more technical knowledge. This knowledge is specific to types of equipment and industries but the underlying skills tend to be somewhat generic. Company managers, instructors and union trainers reported that the types of skills needed to enter and progress on the job could be classified into five major categories: mathematics, reading, writing, listening, and speaking.

CE 057 736

BEST COPY AVAILABLE

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

M Taylor

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Basic workplace research conducted by the American Society for Training and Development and the U.S. Department of Labour also examined the skills needed in the workplace. Carnevale, Gainer, and Meltzer (1988) indicated that more recently employer complaints have focused on serious deficiencies in areas that include problem solving, personal management, and interpersonal skills. In a pioneering attempt to conceptualize the skills employers want, the researchers developed a framework which consists of seven skills groups. These groups include: 1) learning to learn, 2) 3R's, 3) communication, 4) creative thinking and problem solving, 5) goal setting - personal and career development, 6) negotiation, teamwork, and 7) leadership. The authors propose that this framework is a prescription for a well-rounded worker who has acquired a number of discrete skills and who has the ability to acquire more sophisticated skills when necessary.

Recently, in a Canadian context the Ontario Ministry of Skills Development surveyed 329 employers across nine industrial sectors ranging from manufacturing to service hospitality. According to Shields, Embree, Taylor, and Wallace (1989) the purpose of the investigation was to develop a training profile reflecting the skills, competencies, and tasks actually performed in the workplace. The goal of the project was to develop an integrated curriculum accommodating the basic training needs for client groups bound directly for employment and those wishing to qualify for skills training, apprenticeship or post-secondary programs. Occupational literacy skills needed to enter and progress on the job were classified into five major categories: communications (reading, writing, and other linguistic competencies), mathematics, science, computer literacy, and work adjustment.

Together, these studies provide a clear indication of the basic skill categories required of trainees and employees to either enter the labour market or perform effectively on the job. There also appears to be a general consensus that within each major category or group there are articulated lists of specific skills. As Hull and Sechler (1987) point out skill lists are critical tools for personal managers, industrial trainers, and workplace literacy instructors. Basic skill lists help these people relate to a) changing job requirements to needed employee skill levels, b) assess the skill levels of job applicants and existing employees to determine how well those skills match the job requirements for hiring and advancement, c) identify both group and individual basic skill deficiencies in order to plan workplace literacy training programs, and d) analyze the effectiveness of such courses or programs. Based on the findings of the previously discussed research on workplace literacy requirements, an attempt has been made to develop a Basic Skills Profile (Figure 1). This profile is a compilation of the major skill categories with examples of specific skills drawn from evidence in the Ontario workplace. The full range of specific skills are not included here but rather only some of those most frequently cited by employers. The profile may serve to provide a conceptual framework for examining the following tests.

Technical Review of Literacy-Related Assessment Tools

In setting up a workplace basic skills program one of the most important elements is the assessment of the individual employee. Because of the recent Canadian developments in this area, research on the different assessment tools

used in workplace basic skills programs is sketchy. To date no Canadian tests have been developed to identify proficiencies or deficiencies of employees for workplace basic skills training. However, evaluating the appropriateness of existing instruments for use in such programs may provide some insight into further test development strategies. Ten instruments frequently used in adult literacy and basic education programs in adult education centres, technical and vocational schools, community colleges, school boards, and other literacy organizations were reviewed in the full report. Three will be presented here. These tests include: The Canadian Adult Achievement Test (CAAT); Tests of Adult Basic Education (TABE) - Forms 5 and 6; and The Gates-MacGinitie Reading Tests (GMRT) - Canadian Edition. In the full report, each test was reviewed under three categories - test content, test development, and test usability. The purpose of the test and type of items or subtests employed was described under the heading test content. The procedures used to develop the test norms, grade equivalents, reliability, and validity evidence were presented under the heading test development. An evaluative statement was made under the heading test usability. It indicated the appropriateness of the instrument in the assessment of the essential basic skills for the workplace as discussed in the preceding section. An abridged version of that discussion appears here. The test reviews are based on information from the actual test, the test manuals and administrator's guidelines, technical bulletins, a literature search, the Mental Measurements Yearbook, and interviews with instructors in adult literacy and basic education programs.

The Canadian Adult Achievement Test

Test Content: The Canadian Adult Achievement Test (CAAT) is a battery of tests designed to measure the level of educational achievement among adults. The CAAT was developed to fill the need for an instrument which would better meet the assessment requirements of national training programs. The three levels of the CAAT, like the Adult Basic Learning Examination (ABLE), were developed to accommodate segments of twelve years of formal education. Level A is for adults who have had from one to four years of formal education. This level includes five subtests: vocabulary, reading comprehension, spelling, number operations, and problem solving. Level B is for adults who have had from five to eight years of formal education and includes six subtests: vocabulary, reading comprehension, spelling, number operations, problem solving and mechanical reasoning. Level C is for adults who have had at least eight years of formal education and may or may not have graduated from high school. Level C includes the same subtests as Level B as well as a Language Usage subtest and a Science subtest. Like the ABLE, the CAAT vocabulary subtests include words sampled from applied or general vocabulary, from vocabulary of the physical and natural sciences and from vocabulary of the social sciences. Like the ABLE, the CAAT reading comprehension subtests for Level B and C include material of a functional nature and material of an educational nature. As stated by the test authors a core of test items are common to both the CAAT and the ABLE.

Test Development: The test authors state that because there is still no suitable criteria for defining the population of adults across Canada for whom the CAAT would be appropriate, it was decided that CAAT research would be

conducted with a number of adult groups whose characteristics would define the "users" of this type of instrument. The CAAT norms are the results of the collection of data from volunteer users (N=5,700). This standardization procedure does raise serious concerns about the adequacy of the sample. A few of those concerns are mentioned here: 1) the percentage of females taking Level C was higher than the percentage taking Level A and B, 2) most of the participants were under 30 years of age and there were no participants over 40 years taking Levels B or C, 3) overall, the Western and Atlantic region provinces make up 79% of the total sample. The manual contains guidelines for interpreting the content-referenced scores, scaled scores, percentile ranks, and grade equivalents. However, the grade equivalents are based on actual scores of students tested in the U.S. during the development of ABLE. These grade equivalents were obtained by equating the CAAT subtest to the Stanford Achievement Test series.

Test Usability: Although the CAAT measures educational achievement of adults who have had varying amounts of formal schooling and provides a grade equivalent, it is one of the more usable existing literacy tests for a workplace environment. The content of some of the items in the reading, comprehension, problem solving, and mechanical reasoning subtests correspond to work-related topics. When examined against the Basic Skills Profile the CAAT measures only indirectly a small number of the specific workplace competencies.

Tests of Adult Basic Education Forms 5 and 6

Test Content: The Tests of Adult Basic Education (TABE), Forms 5 and 6 are norm-referenced tests designed to measure achievement in reading, mathematics, and spelling. The test authors state that TABE 5 and 6 focus on the basic skills required for a person to function in society. The instrument has seven sections which include reading vocabulary, reading comprehension, mahematics computation, mathematics concepts and applications, language mechanics, language expression, and spelling. There are four overlapping levels with estimated grade ranges: Level E (Easy), range (2.6 - 4.9), Level M (Medium), range (4.6 - 6.9), Level D (Difficult), range (6.6 - 8.9), and Level A (Advanced), range (8.6 - 12.9).

Test Development: Test authors maintain that items are based on educational objectives and broad process classifications. The content categories were defined by examining adult education curriculum guides, published texts, and instructional programs. Vocabulary difficulty was controlled by reference to Basic Reading Vocabularies and the Living World Vocabulary. Norm data are based on 6,300 students from four types of programs in the U.S.: adult basic education programs (including literacy and pre-GED), adult offender programs, juvenile offender programs (juveniles sixteen years or older) and vocational/technical training programs. Norms are reported for each group. Two thirds of the sample were taken from Asian, Black, and Hispanic groups with 49% of the examinees in the 15-24 age group. Manual scoring is moderately complex and time consuming. The number correct on each section is converted to a scale score percentile or grade equivalent by looking in the appropriate norm tables. Grade equivalents are provided through the calibration and equating of TABE 5 and 6 to the California Achievement Tests,

Form E (CAT-E). Kuder-Richardson Formula 20 coefficients range from .71 to .93 and standard errors of measurement are reported. However, the data were based on the administration of the tryout tests, which are somewhat longer than the final TABE tests. Limited validity data is reported in the manuals. The scores on the TABE have correlated moderately (.55 to .64) with comparable scores on the GED.

Test Usability: In terms of workplace usability one of the strongest features of the TABE is that the items are adult in content. The content categories were defined by examining adult education curriculum guides, published texts, and instructional programs. Although the test has an academic orientation some of the specific competencies outlined in Skill Group 1 and 2 of the Profile are indirectly associated. However, the test would not be able to provide information on any of the specific skills mentioned under creative thinking, personal management, and teamwork.

The Gates MacGinitie Reading Tests Canadian Edition

Test Content: The Gates-MacGinitie Reading Tests (GMRT), Canadian Edition consist of seven levels which cover grades 1 through 12 and include vocabulary and comprehension subtests. They are norm-referenced tests. For Basic R and Levels A and B, vocabulary is said to be primarily a test of decoding skills. Learners must select the word that goes with a picture from among choices that look and sound rather alike. For Levels C through F vocabulary is tested by having learners select the correct meaning for a printed word; as a result, the vocabulary test for these levels is primarily a test of knowledge and not a test of decoding skills. Thus, the Vocabulary tests for Levels C through F represent a somewhat different skill than what is measured at the lower levels. Vocabulary items were selected from 16 commonly used reading series for grades 1-3 and from recognized lists of words frequently used in school reading materials. The comprehension subtests for Basic R and for Level A and B require learners to select a picture that answers questions or matches the information given in a short passage. For Levels C through F students must read a passage and answer two or more questions about it. The comprehension subtests at all levels involve both literal and inferential questions, but the percentage of inferential questions increase in Levels D, E, F. The subject matter content of the Comprehension Tests emphasize material from the humanities, social sciences, the natural sciences or narrative material. The selections included range from current materials by contemporary writers to important timeless writings.

Test Development: To construct the norms, a sample of 46,000 Canadian students was tested from 10 provinces and the Yukon Territory. In provinces with large French speaking populations, English speaking students constituted the norming groups. The sample appears to have been carefully selected to be representative of Canadian students and the manual contains adequate guidelines for interpreting the standard scores, percentile ranks and grade equivalents. Although the vocabulary and comprehension subtests are said to measure two somewhat different abilities, no information is available in the manual to support this claim. For Levels A to F split half reliability coefficients for vocabulary range from .85 to .94 and for comprehension from .85 to .92. For Levels B through F, these coefficients are only given for

Form 1. No information is given on reliability for the total scores on each testand no statistical data on test validity is presented in the manual. An attempt has been made to establish content validity by explaining how the items were developed to reflect typical school programs.

Test Usability: Based on the five categories of the Basic Skills Profile the Gates MacGinitie does not measure the majority of the specific workplace competencies reported by employers. However, for the discrete skill of reading some of the vocabulary items and comprehension selections in Levels D, E, and F are common to both school and work environment. This tool is a standardized achievement test and, like the CAAT and ABLE, may be useful for employees wanting to obtain a grade equivalency in a workplace learning environment.

Further Test Development Strategies

In summary, most of the ten literacy-related tests have made laudable attempts to ensure adult content and tone but are not specifically job-related. Some of the instruments with psychometrically strong qualities could be useful if a company elects to provide general literacy services to their employees such as a high-school equivalency program. In the full technical review three assessment tools were criterion-referenced tests which emphasized learner performance on everyday situations of adult life but not situations related to the world of work. Using a criterion-referenced approach to test development of specific work-related skills may be more appropriate for employees in basic workplace training.

References

Carnevale, A., Gainer, L., & Meltzer, A. (1988). Workplace Basics. The American Society for Training and Development and U.S. Department of Labor, Employment & Training Administration. Wahsington, DC.

Hull, W., & Sechler, J. (1987). Adult Literacy. National Center for Research in Vocational Education. Ohio State University, Columbus, Ohio.

Shields, B., Embree, R., Taylor, M., & Wallace, L. (1989). Occupational Literacy. Ontario Ministry of Skills Development, Toronto, Ontario.

Tests

Canadian Adult Achievement Test. The Psychological Corporation, Harcourt Brace Jovanovich, Canada. Toronto, Ontario.

Tests of Adult Basic Education. CTB/McGraw-Hill, Monterey, California.

Gates-MacGinitie Reading Tests, Canadian Edition. Nelson Publishing Company, Canada.

Figure 1: A Basic Skills Profile

1. **Basic Literacy and Numeracy Skills (reading, writing, and computation)**

   . Read notes, job orders, schedules, charts, regulations, and instructions
   . Read to determine facts, opinions or implied meanings
   . Write short notes and single paragraph letters, short phrases and sentences.
   . Estimate how long it will take to do a job and measure metric units

2. **Basic Listening and Oral Communication Skills**

   . Receive facts or directions and give information
   . Understand opinions, purposes or implied meanings
   . State possible reasons which might cause certain faults or symptoms

3. **Creative Thinking and Problem-Solving Skills**

   . Ask probing questions, use reference manuals, and show information
   . Establish a priority or sequence in checking for problems
   . Solve numerical problems in word form
   . Implement solutions and track and evaluate results

4. **Personal Management Skills (skills related to developing the attitudes and behaviors required to keep and progress on the job)**

   . Know company policies and practices and employer/employee expectations
   . Showing initiative and suggesting new ideas for getting a job done
   . Learn new skills and ways of doing things
   . Know the basic workplace hazards and care of equipment and materials

5. **Teamwork Skills (skills needed to work with others on the job)**

   . Work with supervisors and co-workers
   . Sticking to a schedule and decision-making skills
   . Giving directions and feedback
   . Identify with the goals, norms, values, customs, and culture of the group